

REMARKS

In the Office Action, the Examiner rejected pending claims 1-38. Applicants respectfully request reconsideration and allowance of all pending claims based on the following remarks.

Rejections Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1-6, 9-13, 17-20, 23-25, 27, 28, and 34-36 under 35 U.S.C. § 102(b) as being anticipated by Morron et al. (U.S. Patent No. 6,025,980). Applicants respectfully traverse this rejection. A *prima facie* case of anticipation under 35 U.S.C. § 102 requires a showing that each limitation of a claim is found in a single reference, practice or device. *In re Donohue*, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985).

The present application is directed to a technique that suppresses and prevents leakage current from reaching and energizing a relay coil, while allowing a control signal (when applied) to reach and energize the relay coil. Accordingly, embodiments of the application provide for a leakage current suppression circuit configured electrically in *parallel* with a solid state switch that activates the relay coil. In operation, if the applied control signal current exceeds a threshold current value greater than leakage current values, the leakage current suppression circuit permits the control signal to reach the solid state switch which then activates (energizes or deenergizes) the relay coil. The control signal itself may serve a variety of control functions, and may exist independent of the presence or absence of leakage current.

Conversely, the Morron et al. reference is directed to *detecting* the presence of earth fault current. Thus, a comparator circuit 15, unlike the present leakage suppression current circuit, is configured electrically in *series* with a transistor switch 16 which receives a control signal generated by the comparator circuit 15 to activate a relay coil.

The Morron et al. control signal is generated only if earth fault current is detected (i.e., if earth fault current is present and if it exceeds a threshold value). Thus, unlike the presently claimed control signal which may exist independent of leakage current, the Morron et al. control signal exists only if earth fault current is present.

Independent Claims 1, 11, and 19

The Examiner pointed to figures 1, 5, and 6, as well as column 2, lines 38-45, column 3 line 47 - column 4 line 3, and column 4, lines 32-35, of the Morron et al. reference as disclosing features recited in independent claims 1, 11, and 19. However, Applicants have carefully reviewed these portions of the Morron et al. reference, as well as the entire reference, and strongly emphasize that the Morron et al. reference fails to disclose features recited in independent claims 1, 11, and 19.

For example, the cited reference does not disclose, “a leakage current *suppression* circuit” coupled electrically “in *parallel* with the solid state switch,” as recited by claims 1, 11, and 19. Instead, the cited reference discloses a *comparator* circuit 15, which the Examiner incorrectly equates with a leakage current *suppression* circuit. The comparator circuit 15 *detects* (and does not dissipate or suppress) the presence of an earth leakage current, and generates a control signal that is sent to a transistor switch 16 if earth leakage current is detected. Thus, the comparator circuit 15 is configured in *series* with the transistor switch 16. *See e.g.*, Morron et al., col. 1, lines 54-58; col.2, lines 37-44; col.3, lines 47-61; and Fig. 1. This is the exact opposite configuration of the claimed leakage current suppression circuit which is coupled in *parallel* with a solid state switch.

The Morron et al. reference also fails to disclose the situations of when “a control signal current level is above a leakage current threshold” and when “the control signal level is below a leakage current threshold,” as recited by claims 1, 11, and 19. Indeed, the system disclosed in cited reference never compares a control signal level to a threshold, but instead compares earth fault leakage current to a threshold. After all, in Morron et al.,

the purpose is to detect the presence of earth fault leakage current, and thus the stated threshold is a relatively low value that differentiates between no current at all and the presence of an earth leakage current. *See* col. 3, line 47 - col. 4, line 3; and col. 4 line 66 - col. 5, line 3. Conversely, in the present application, the leakage current threshold is a relatively higher value that differentiates between leakage current and a control signal current. It is clear that the Morron et al. system, unlike the claimed technique, never compares a control signal current level to a threshold.

Accordingly, because the Examiner failed to show that the prior art recites *all* of the elements of claimed invention, a *prima facie* case of anticipation has not been established. Therefore, independent claims 1, 11, and 19 and their respective dependent claims 2-10, 12-18, and 20-28, are believe to patentable over the Morron et al. reference.

Independent Claim 34

In rejecting independent claim 34, the Examiner pointed to figures 1, 5, and 6, column 3 line 64 - column 4 line 3, and column 4, lines 32-35, of the Morron et al. reference as disclosing features recited in independent claim 34. However, Applicants have carefully reviewed these portions of the Morron et al. reference, as well as the entire reference, and strongly emphasize that the Morron et al. reference fails to disclose features recited in independent claim 34.

For example, the cited reference does not disclose that a “relay coil is energized if a current level of an input control signal is above a predetermined leakage current threshold level and is deenergized if the current level of the input control signal is below a predetermined leakage current threshold level,” as recited by claim 34. Again, the Morron et al. reference does not disclose the comparison of a control signal current level to a threshold. Instead, the Morron et al. reference discloses the comparison of earth fault current level to a threshold. *See* col. 3, line 47 - col. 4, line 3; and col. 4 line 66 - col. 5, line 3.

It should be emphasized that in Morron et al., it is desired that the presence of earth leakage current energize the relay coil. This is the exact opposite of the method of claim 34 where energizing of the relay coil with leakage current is to be avoided. Instead, in the claimed method, it is the independently applied control signal (exceeding a leakage current threshold) which desirably activates the relay coil. To clarify the difference, it is worth explaining that the Morron et al. reference is concerned with sensing non-zero resultant current in a multi-phase electrical distribution circuit, and distinguishing between true earth fault current and harmonic noise. To accomplish this, the non-zero resultant current is converted to an "earth leakage" voltage signal and is filtered to render the signal insensitive to harmonic noise within the electrical system and to thus avoid nuisance tripping of the disclosed relay by harmonic noise, without sacrificing sensitivity to an actual earth fault occurrence. Column 1, lines 52-60; column 2, lines 18 – 29; and column 4, line 66 – column 5, line 3. Again, this is inapposite to the method of claim 34 where insensitivity by the relay to leakage current is exactly what is desired. In other words, in the method of claim 34, tripping of the relay with leakage current is a "nuisance" to be avoided, whereas in Morron et al., tripping of the relay because of the presence of earth leakage current is precisely what is desired. After all, the relay disclosed in Morron et al. is a protective relay that interrupts the disclosed distribution circuit in the presence of a true earth fault condition. Column 1, lines 52-60; column 2, lines 37-45; and column 4, line 66 – column 5, line 3.

Accordingly, the Examiner failed to show that the prior art recites *all* of the elements of claimed invention, and thus has not established a *prima facie* case of anticipation. Therefore, independent claim 34 and its respective dependent claims 35-38 are believed to be patentable over the Morron et al. reference.

Rejections Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 29, 30, 32, 33 under 35 U.S.C. § 103(a) as being unpatentable over Gernhardt et al. (5,864,455) in view of Morron et al. Applicants respectfully traverse this rejection. Claim 29 is independent.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Independent Claim 29

In making the rejection, the Examiner admitted that the Gernhardt et al. reference (apparently mislabeled by the Examiner in the Office Action as the “Misencik reference”) does not disclose “leakage current protection.” The Examiner then incorrectly relied on the Morron et al. reference (as in the § 102 rejection above) as disclosing “a leakage current suppression circuit” coupled electrically “in parallel with the solid state switch,” as recited by independent claim 29. The Examiner also incorrectly relied on the Morron et al. reference as disclosing when “a control signal current level is above a leakage current threshold” and when “a control signal level is below a leakage current threshold,” as recited by claim 29. On these points, the Examiner again cites column 2, lines 38-45, column 2, line 47-column 4, line 3, column 4, lines 32-35, and Fig. 1, of the Morron et al. reference.

However, as similarly discussed above with the other independent claims, the Morron et al. reference does not disclose a leakage current suppression circuit coupled electrically in parallel with a solid state switch. Instead, the Morron et al. reference discloses a comparator circuit 15 configured in series with a transistor switch 16. *See e.g.*, col. 1, lines 54-58; col.2, lines 37-44; and Fig. 1. This series configuration is expected in the Morron et al. system because the comparator circuit 15 the earth fault current and sends a control signal to the switch 16. *See e.g.*, col. 3, line 47 - col. 4, line 3.

Further, as discussed, the Morron et al. reference does not disclose a system that compares a control signal level to a threshold. After all, the Morron et al. circuitry is configured to detect earth fault current, and thus it is earth fault current that is compared to a threshold. When the earth fault current exceeds the stated threshold, the comparator circuit 15 generates a control signal. *See e.g.*, col. 3, line 47 - col. 4, line 3. The Morron et al. control signal itself is never compared to a threshold.

Because the cited combination does not disclose all of the recited features of claimed invention, the Examiner has failed to *prima facie* case of obviousness with respect to claim 29. Accordingly, independent claims 29, and the claims that depend thereon, are believed allowable over the cited combination. Additionally, the cited dependent claims are also believed patentable by virtue of the subject matter they separately recite.

Dependent Claims

The Examiner rejected claims 7, 8, 15, 16, 26, and 38 as being unpatentable under 35 U.S.C. § 103(a) over Morron et al. in view of Misencik (5,541,800). Applicants respectfully traverse this rejection. The Examiner relied on the Misencik reference as disclosing a ground fault interruption circuit comprising a "LED indicator." However, the Misencik reference fails to obviate the deficiencies of the Morron et al. reference

discussed above with respect to the independent claims. Further, the dependent claims are also believed patentable by virtue of the subject matter they separately recite. Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness with respect to dependent claims 7, 8, 15, 16, 26, and 38.

The Examiner rejected claim 31 under 35 U.S.C. § 103(a) as being unpatentable over Gernhardt et al. in view of Morron et al. in further in view of Misencik. Applicants respectfully traverse this rejection. The Examiner again relied on the Misencik reference as disclosing a ground fault interrupt circuit comprising an “LED indicator.” However, the Gernhardt et al. and Misencik references fail to obviate the deficiencies of the Morron et al. reference discussed above with respect to independent claim 29. Furthermore, claim 31 is believed patentable by virtue of the subject matter it separately recites. Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness with respect to dependent claim 31.

The Examiner rejected claims 21 and 22 under U.S.C. § 103(a) as being unpatentable over Morron et al. in view of Gernhardt et al. Applicants respectfully traverse this rejection. The Examiner relied on the Gernhardt et al. reference as disclosing that “the relay and the switch are supported” on a circuit board and on a terminal block. However, Gernhardt et al. does not obviate the deficiencies of the Morron et al. reference discussed above with respect to independent claim 19. Accordingly, the cited combination fails disclose all of the recited features of claim 21 and 22. Furthermore, claims 21 and 22 are also believed patentable by virtue of the subject matter they separately recite. Therefore, the Examiner has failed to establish *prima facie* case of obviousness with respect to dependent claims 21 and 22.

The Examiner rejected claim 14 under 35 U.S.C. § 103(a) as being unpatentable over Morron et al. in view of Oreartuin (6,275,400). Applicants respectfully traverse this rejection. The Examiner relied on the Oreartuin reference as disclosing a circuit

comprising a "diode." However, the Oreatuin reference fails to obviate the deficiencies of the Morron et al. reference discussed above with respect to independent claim 11. Accordingly, the cited combination fails to disclose all the recited elements of claim 14. Furthermore, claim 14 is also believed patentable by virtue of the subject matter it separately recites. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness with respect to dependent claim 14.

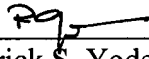
Because all of the cited combinations listed above do not disclose all the elements, much less provide any suggestion to combine or modify the references in manner recited by the claims, they do not support a *prime facie* case of obviousness. Furthermore, again, the dependent claims are believed to allowable for their subject matter separately recited, as well as, for reasons provided above with respect to the independent claims. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejections and allowance of the claims.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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